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ANNOUNCEMENTS

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Our staff has been strengthened by the addition of an associate editor: Raymond H. Thompson, Department of Anthropology, University of Kentucky.

Contributions and Subscriptions: The editors invite articles and notes in all fields of linguistics -- historical, comparative, descriptive, etc. -- and in peripheral fields (such as anthropology, information theory, psycholinguistics) where the topic is of linguistic interest or concern.

MSS may follow any of the generally recognized forms, but footnotes will be printed at the ends of the papers. Special problems of form may be taken up with the editors. Send MSS, checks, inquiries, etc. to John A. Rea, Department of Modern Foreign Languages, to Raymond H. Thompson, Department of Anthropology, or to John L. Cutler or George P. Faust, Department of English, University of Kentucky, Lexington, Kentucky. Checks should be made payable to General Linguistics. Subscriptions are $2.00 per year, individual issues $1.00 each.

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STRESS AND INTONATION

Lee S. Hultzen
University of Illinois

0. Before stating my thesis I should probably do well to fix the referents of not always unambiguous terms for this discussion.

0.1. By stress I refer to the feature which is known to acoustics as intensity and measured as relative sound pressure. By pitch to the feature which is acoustic frequency and measurable as such. For both terms the organogenetic referents, although readily identified, furnish no descriptive terminology and need not concern us here. Nor is the acoustic terminology, decibels and cycles per second, of much use for general description. Our practical terminology is auditory or perceptual. We speak of stress as loud or soft, with such discrete intervals as any particular theory wants to set up; of pitch as high or low, also with the possibility of discrete intervals.

It hardly needs to be noted that our concern is with relative, not absolute, stress and pitch. Or that the domain of both is, at the point of most detailed analysis, syllabic or something of the sort. Each syllable is perceived as having a degree of stress and a pitch, the latter either roughly a single pitch or a turn of pitch.

I shall want to use accent as a covering term, referring to relative syllabic prominence whether achieved by stress or pitch or both, and without regard for other features which may enter into the composition of prominence.

One may also speak of patterns of stress or of pitch, the latter as intonation. In my title I use stress and intonation as rubrics for discussion of the way in which stress and pitch constitute patterns.

0.2. It is customary to look upon stress as something primary with respect to intonation. For example, Trager and Smith treat stress first, and independently of intonation, and then intonation with allophones determined by previously discovered stress.[1] They note specifically the possibility of "an abstraction consisting only of segmental phonemes . . . accompanied by . . . stresses" which

"can be . . . made pronounceable by adding pitches".[2] Most of the published phonetic transcriptions and many phonemic representations show stress without intonation. Where intonation is included, it is often as something added.

0.3. My thesis is that there is no a priori or demonstrated basis for assuming that accent, in English, is primarily a matter of stress rather than of intonation. As corollaries: 1. The mark of accent may as well be considered an indication that the syllable has actual or potential significant intonation in utterance, as an indication that it has relatively louder stress. 2. Stress-intonation can be indicated by marks which do not imply that one or the other is primary.

0.4. I fancy it would be difficult to prove any primacy of stress or intonation. The fact that lexical stresses are fairly uniform for all speakers of a language and the intonations highly variable is not to the point, for the intonations, however different, appear in utterances and are correlated with the stresses, which is all that the thesis states. It might be noted that artificially produced speech can be so manipulated as to have stress without intonation and intonation without stress; listeners seem to perceive the relative syllabic prominence as well in one case as in the other, in fact to imagine the utterances with the missing feature filled in.[3] I shall therefore proceed at once to consideration of methods for simultaneous indication of stress and pitch and then take up some of the implications of the system.

1. The desideratum in symbolization of what has been called tonetic-stress[4] is that each mark should indicate both such a degree of stress and such a pitch or pitch-turn as it seems expedient to discriminate.

1.1. Minute analysis seems to call for some kind of staff visualization, with stress shown by size of dots, one for each syllable, and pitch by their position in the staff, with tails for turns. The staff may be of any form: three lines, for highest, lowest, and mid pitch, as I find convenient; or single line for reference; or even no line. In such a system the segmental line below the staff need indicate only segments and internal junctures. External junctures appear as bars through the staff or through both staff and segmental line, to indicate only interruption of the flow of utterance; the intonational aspect of what are called terminal junctures[5] is taken care of by the intonation shown in the staff.

1.2. It is also possible to symbolize tonetic-stress in the segmental line, i.e., without a staff, by marks before each syllable, or, if one prefers, before the nucleus of each syllable. Such a system was designed by Kingdon in 1939.[6]

The regular short vertical mark high, ˈ, indicates a syllable with what is conventionally known as a primary stress, and pitch without perceptible up- or downturn. Slanted up to the right, ˊ, it indicates the same with upturn of pitch; slanted down to the right, ˋ, the same with downturn of pitch.

The same marks lowered, ˌ ˊ ˋ, indicate a secondary accent, a lesser degree of stress, without or with turn in pitch.

The primary accents doubled, ˈˈ ˊˊ ˋˋ, indicate strong accent, a greater degree of stress and higher pitch. Doubled marks in the position of secondary accents, ˌˌ ˊˊ ˋˋ, indicate strong accent with lowering rather than raising of pitch.

Where needed, accent marks with modified slants can be used, ˊˋ -; or marks can be combined to indicate combinations of turns, ˅ ˄ ˄˩.

These accent marks take care of three degrees of stress with accompanying pitch, without commitment as to whether stress or pitch is primary.

1.3. As to the marking of unaccented syllables, the case for marking least degree of stress is presently tenuous and that for leaving unmarked the accompanying pitch can be established on other grounds than by analogy.

The arrangement of unaccented syllables which is part of the intonation characteristic of the dialect and individual, about which more anon, need not be noted, pitchwise as well as stresswise. For phonetic description of utterance it can be described in a covering note; for prosodemic generalization it is not significant.

Arrangements of unaccented syllables which do have prosodemic significance in communication seem to be taken care of by marking the accented syllables only. Thus in English an upturn at phrase

end seems to be distributed over the unaccented syllables, if any, following the last accented syllable. A downturn, whether in the middle or at end of the phrase, takes place within the accented syllable, and following unaccented syllables are low. There is difference of opinion on this last detail, but not important, since the arrangement of the unmarked accents is determined by the opinion.

1.4. There remains only the question of pitch levels of the pitch of one primary accented syllable relative to that of another in the same phrase. Trager and Smith's "ONLY ONE primary stress" for a "minimal complete utterance" or phrase[7] is to be rejected on grounds not to be gone into here, although some of the evidence will appear anon.

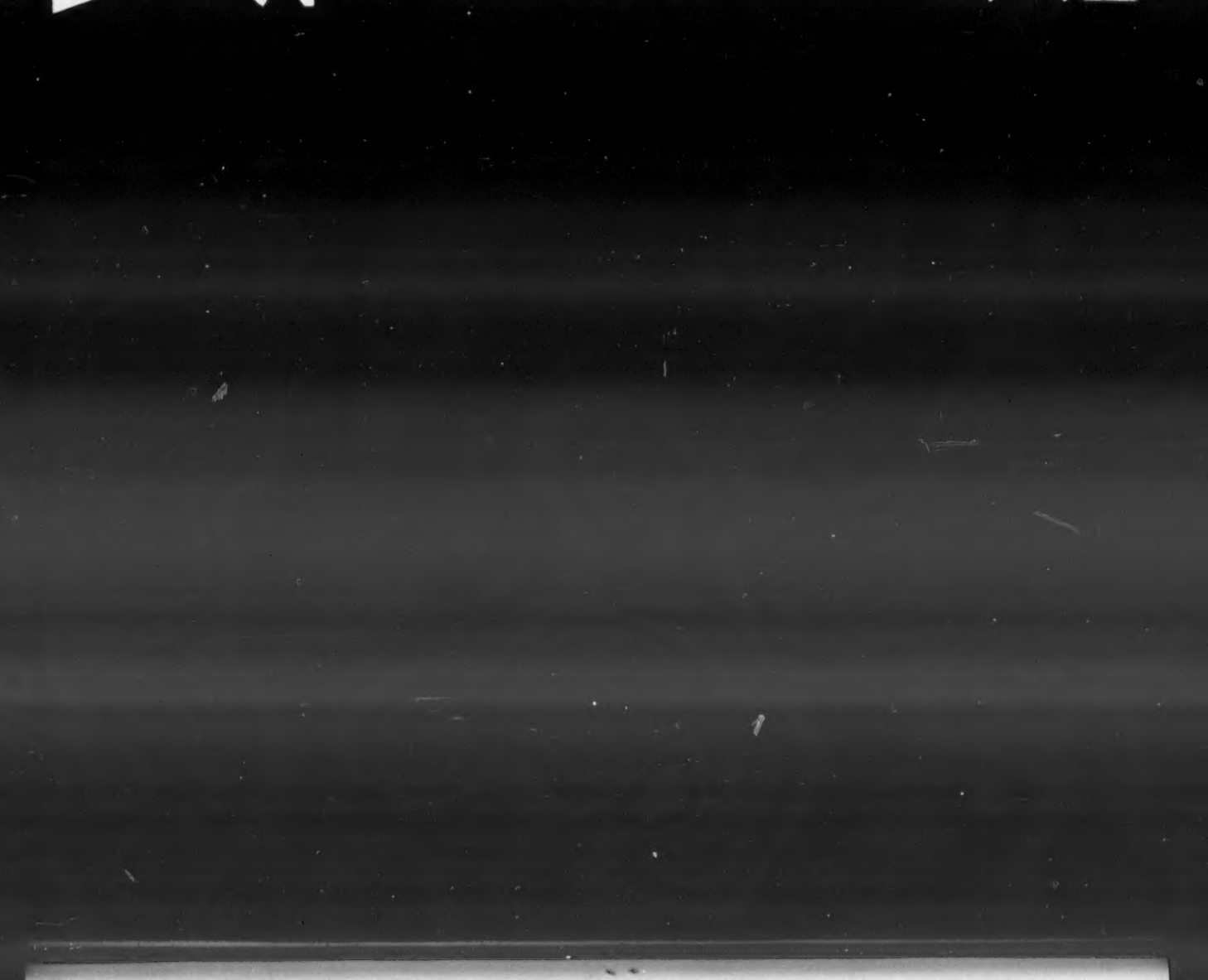
It has frequently been pointed out that each language and each dialect has a characteristic pattern of phrasal intonation which is manifested in all utterances of speakers of the language and dialect, and that each speaker has an individual characteristic pattern in which his individuality plays upon the language-dialect pattern.[8] The pattern includes relative pitches of successive accented syllables and the pitches of unaccented syllables relative to those of the accented and of each other. A description of the pattern will also take note of the discreteness of the pitches and the intervals.

Given such a basic tune pattern, the marking of primary and secondary accents indicates that the marked syllables have the places which primary and secondary accents have relative to each other in the pattern, and that the unmarked syllables have the places of unaccented syllables in the pattern.

Still within the basic pattern, pitch turns, or lack of turn, at phrase end indicate the intonation of so-called terminal juncture.

A strong-accent mark, however, indicates departure from the basic tune pattern. This is not to say that phrases containing strong accent are comparatively infrequent, but that the intonation of a phrase containing one or more strong accents is to be analyzed as basic pattern plus departure rather than as an independent pattern.

1.5. The indication of tonetic-stress is then complete, an arrangement of accented and unaccented syllables in a pattern, with terminal direction, and specified departures from the pattern.



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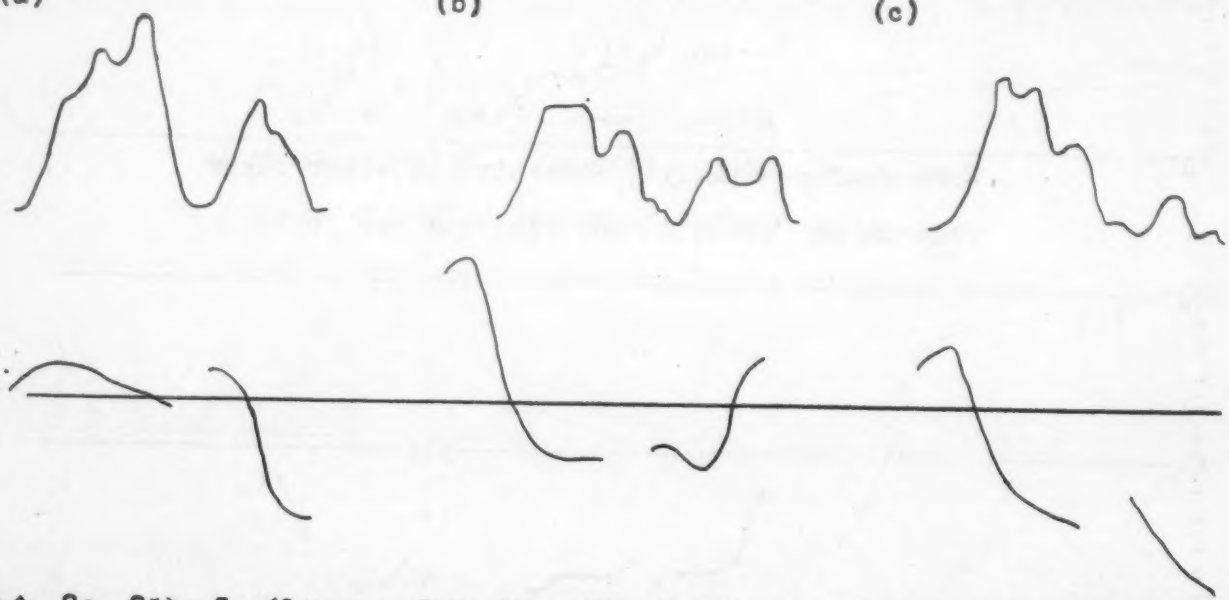
Instrumental analysis for a, b, c (Trager): Relative sound pressure from high speed level recorder 50mm sec., no reference line; Intonation from spectrograms by special technique not fully validated, with reference line indicating same pitch, not specified level. Smith-Trager analysis in detail, OES pp.42-3. Tonetic-stress analysis theoretical, to account for S-T distinctions.

(a) (b) (c)



(a) ˀhâw+ˀdə+ˀðèy+ˀstə́ˀdiy-

ˈhaw də ðe ˈsdʌdɪ ‖

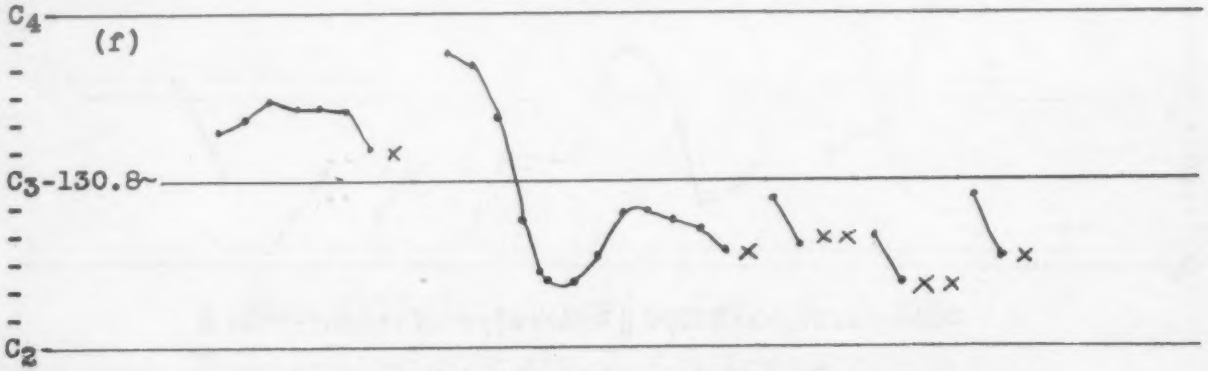
(b) ˀhâw+ˀdə+ˀðèy+ˀstə́ˀdiy+

ˈhaw də ðe ˇsdʌdɪ ‖

(c) ˀhâw+ˈdə+ˈðèy+ˈstə́ˈdiy-

ˈhaw də ðe ˈsdʌdɪ ‖

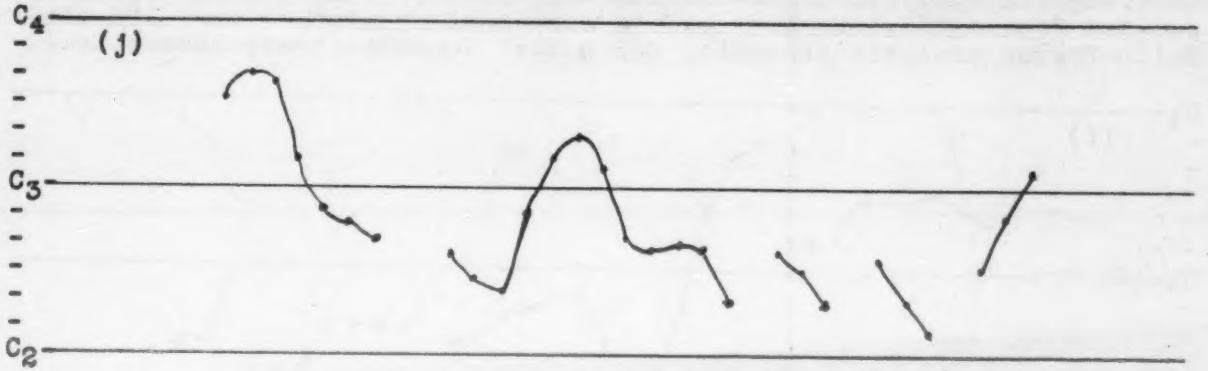
Instrumental analysis of intonation only for f, g, i, j (Smith), calculated from oscillograms as points representing average over .05 sec. Smith-Trager analysis phonemic, OES p.51. Tonetic-stress theoretical.



^{2}hêw+də+ðèy+^{3}stédiy^{2} | ^{2}nêw+wìyv+gât+ðèhr+^{3}búks^{1}#

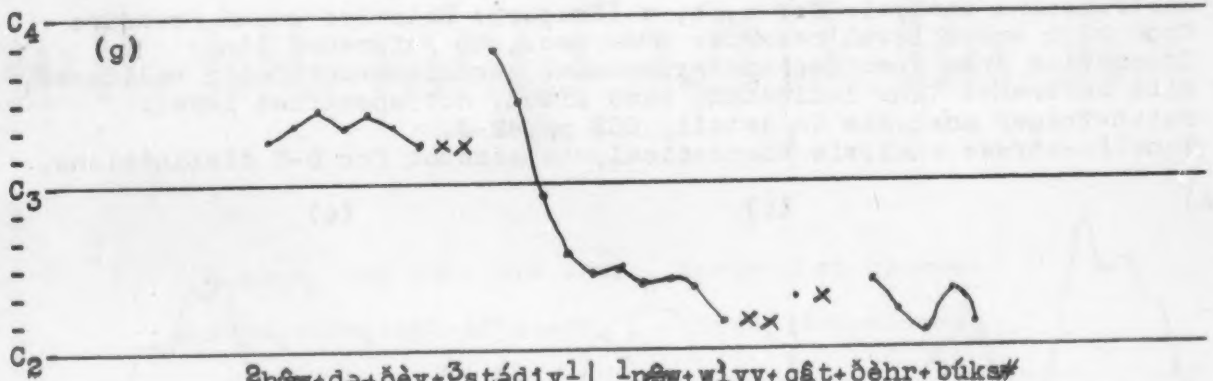
ˈhaw də ðe ˌsdʌdɪ | ˈnaw wɪv ˈgat ðɛr ˈbuks ‖

ˈhaw də ðe ˈsdʌdɪ | ˈnaw wɪv ˈgat ðɛr ˊbʊks ‖



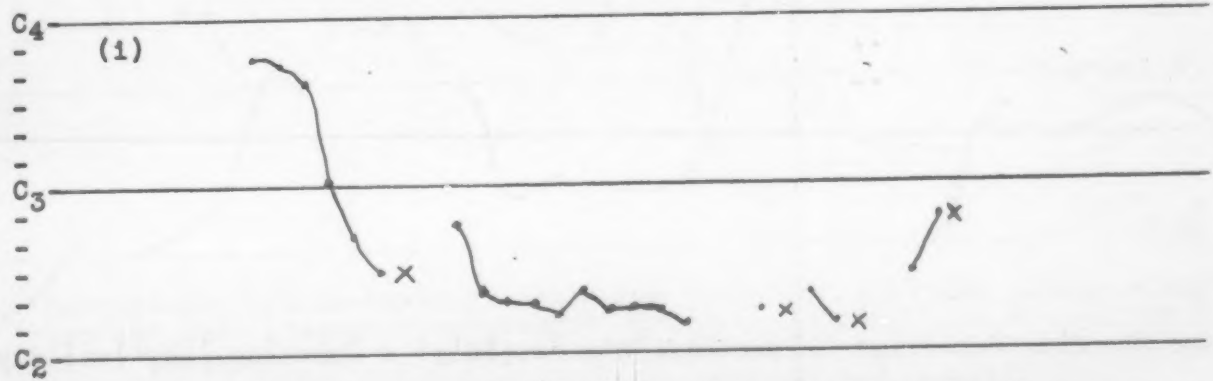
3hə̂w+də+ðèy+stə̂diy2 ‖ 2nə̂w+wì̀yv+gât+ðèhr+bʊ́ks ‖

ˈhaw də ðe ˇsdʌdɪ | ˈnaw wɪv ˈgat ðɛr ˊbʊks ‖



^{2}hâw+də+ðèy+^{3}stédiy^{1} | ^{1}hâw+wìyv+gât+ðèhr+búks#

ˈhaw də ðe ˈsdʌdɪ | ˈnaw wiv ˈgat ðɛr ˈbuks ‖



^{3}hâw+də+ðèy+stêdiy^{1} | ^{1}hâw+wìyv+gât+ðèhr+búks ‖

2. The adequacy of a system of this sort is to be examined in the light of what information is communicated by patterns of stress, patterns of intonation, and patterns of tonetic-stress. I shall of course and until the contrary is demonstrated maintain that the first two do not function independently of the third.

Aside from the communication of dialect and individuality in the basic pattern, the principal areas of communication in tonetic-stress are three: 1, indication of the syntactical structure of the phrase; 2, pointing to the lexical items of significance in the phrase; and 3, intensifying the pointing.[9] If there may be possibilities of more subtle communication, we should do well to ignore them until after we have examined thoroughly these three.

2.1. The syntactical communication is taken care of by the terminal turn or no-turn of the phrase. I doubt that the terminal intonation can as a matter of direction of turn communicate anything more than syntax.

2.2. The deictic communication, which as such can be no more than pointing out the lexical item, is taken care of by strong accent at any point in the prase or, for basic patterns which have turns only at end of phrase, by a nonfinal turn. That is, any departure from the basic pattern calls attention to the lexical item, and that is one of the functions of tonetic-stress. It is to be noted that certain positions in the structure of the basic tune pattern may be emphatic, as initial or final in what I think is the principal pattern of American English. Lexical items in such positions do not need strong accent to be pointed out.

2.3. Greater than usual intensity of pointing is communicated by greater departure from the basic pattern, without or with greater range of turn. That is, tonetic-stress communicates what it can to special meaning by making the accented syllable of the significant lexical item conspicuous as a departure from the basic tune, and can add emphasis to the pointing by extraordinary departure.

3. It is of course to be recognized that lexical accentuation fixes, within certain limits, the syllables which are accented as a matter of routine and which can be strong-accented in utterance. This is the one importance of the lexicon in our consideration of phrasal accents, and it is not necessary to make a distinction between word accent and sentence accent.

3.1. As to the presentation of lexical items where it is not advantageous to indicate syntactical or deictic relationships, simple primary and secondary accent marks can be used with the convention that such marks indicate relative stress and at the same time the potentiality of the pitch appropriate when the items appear with intonation in an utterance. It should be noted that monosyllabic content words, as distinguished from form-words, function words, are lexically accented items; and that combinations of words such as go out, caught sight, cold blooded are substantially lexical items, in some of which a secondary accent is fixed.

4. In connection with the preparation of this paper, I have applied the suggested system of indicating tonetic-stress to the examples of intonation given by Trager and Smith in their Outline of English Structure.[10] Messrs Trager and Smith very kindly furnished me some time ago with a tape recording of their readings of the examples. They now, again very kindly, give me permission to present here a few instrumental analyses of their readings, along with their symbolic analyses, as published, and mine, here first shown. They are of course not responsible for what I had the laboratory technicians do with their tape recordings, or for my interpretation of the stress-intonation, which is as entirely theoretical as theirs, made prior to rather than based on the instrumental analysis. They would have it made clear "that sound-pressure level has, in our opinion, nothing to do with phonemic stress."

On this last point I would confess that instrumental analysis is in their terms "prelinguistic," with whatever inferiority may be implied by the label. I would suggest, however, that it might be highly desirable to find a few objective criteria which, once established, could serve as compulsions to agreement. I do not see the possibility of such criteria otherwhere than in instruments for acoustic analysis. Granted that the correlations between the data which instruments can furnish and the physiological activity of producing speech or its auditory perception have not yet been fully established, it seems to me that we should do well to look towards the establishing of the correlations rather than reject the instrumental evidence out of hand.

4.1. The primary purpose of the exhibits is to set my tonetic-stress system of transcription over against their pitch-phoneme system with allophones determined by stress and external juncture. The difference in segmental notation is of no importance at the moment. My spacing in place of their signs of plus juncture avoids raising the

question, although I rather think it might be raised, of whether or not the pluses have any acoustic, or indeed any, referent. Only the marks concerned with stress, pitch, and external juncture are pertinent.

Granted the validity of a basic carrier tune, whatever its form, I rather think that the tonetic-stress symbolization accounts for all of the distinctions made by the four-pitch-phoneme system, not in more detail, but with complete adequacy and much more simply.

4.2. I should like to make a couple of comments on the instrumental evidence, on the distinctions made by Trager and Smith between primary and secondary, and between tertiary and weak stress, and the correlated distinctions in pitch.

In example (a) how is marked with secondary stress and the first syllable of study with primary. It is to be noted that Trager and Smith equate stress with loudness. "It is precisely degree of loudness we are examining."[11] The analysis of relative sound pressure, physical equivalent of loudness, shows some 10 db. difference in the opposite direction, how louder than stud. The inherent greater loudness of |aw|, 2.6 db as between |aɪ| and |ʌ| according to one study,[12] can account for only part of this contradiction.

In the same example, the highest pitch of study, marked as highest allophone of 3 pitch, is only slightly if any above that of how, marked as second-highest allophone of 2 pitch. It is less than half a tone higher in the detailed pitch analysis of Smith's reading of the example, not shown, as compared with 8 tones in the 3-1 fall of study and a range of nearly 6 tones within the pitch 2 phoneme of his example (b).

As to the tertiary stress of they and the weak stress of do and the assumed lower pitch allophone of the latter, the instrumental analysis shows less loudness for they in many places, conspicuously in example (c) shown here, and lower pitch in all of the examples shown here.

In sum, I question the distinctions between primary and secondary and between tertiary and weak stress in the form in which Trager and Smith make them. My analysis ignores such distinctions.

1. Outline of English Structure (SIL: Occasional Papers 3, 1951), 35-9, 41-50.

2. OES 50.

3. Walter Lawrence, Electronic Speech Synthesizer, demonstrated at the University of Illinois 20 Oct. 1953.

4. R. Kingdon, Maître Phonétique 68.60-4 (1939).

5. OES 46.

6. Cf. note 4.

7. OES 49.

8. Hultzen, papers read at meetings of LSA 1946 and summer 1952. Cf. Pike's "colorless carriers of acceptable speech," Intonation of American English, University of Michigan Publications, Linguistics 1.108 (1945).

9. Cf. H. O. Coleman "Intonation and Emphasis," Miscellanea Phonetica 11 (1914).

10. OES 42-51.

11. OES 36. More than ten references to loudness on pp. 35-7.

12. Fairbanks-House-Stevens, JASA 22.457-9 (1950).

PREVERBAL AND POSTAUXILIARY SUBJECTS IN ENGLISH

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University of Kentucky

The purpose of this paper is to try out a method for identifying and classifying the preverbal and postauxiliary subjects of finite verbs and verb phrases in a sophisticated variety of written English. The corpus, a small sample, consists of six excerpts from as many articles in the Atlantic Monthly for August, 1952:

A. The Atlantic Report on the World Today: Spain, p. 8.
B. Elmer Davis, "News and the Whole Truth," p. 34.
C. Josephine Johnson, "Tenants of the House," p. 40.
D. Senator Paul H. Douglas, "What It Costs to Run," p. 44.
E. Archibald Rutledge, "Nothing Ever Happens Here," p. 48.
F. Thornton Wilder, "The American Loneliness," p. 66.

Written English is taken to be a form of language intermediate between primary speech and the derived speech called reading. Since sophisticated written English is interdialectal, it is controlled more by the overall pattern of the language than by the pattern of any one dialect, though the relations are intricate both historically and at present. From the point of view of derived speech, the writing system represents segmental morphemes in linear order, but with open transition irregularly marked by space or hyphen and clause terminal by punctuation (comma, period, and their equivalents). Intonation morphemes are not specified even when marked, as variation in the reading of the same passage shows.[1]

Certain information about primary speech can be transferred to written English and assumed as known: (a) a morphology, including those suprasegmental features which are symbolized in writing; (b) a list of auxiliaries, with starred forms here declared finite: be, better*, can*, could*, dare, do, have, may*, might*, must*, need, ought*, shall*, should*, used*, will*, would*;[2] (c) verbal phrases and their constituents: might have been being built;[3] (d) nominal phrases and their constituents, including non-adjectival modifiers: very nearly all the five good young men.[4]

To avoid analyzing derived speech rather than written English, it will be necessary in this paper to limit consideration of suprasegmental morphemes--intonation and superfix patterns--to those

which are evidenced by punctuation or spelling (e.g., although, sometimes). The limitation is forced by the nature of the material and the procedure; it does not minimize or reject the grammatical importance of the suprasegmental morphemes in primary and derived speech. In practice it proves necessary to assume a correlation between the segmental morphemes symbolized in writing and the morphemic words[5] of speech. But the correlation is sometimes variable, and certainly not one to one: 'most of them' may appear in derived speech as either /mówst ǰ+ə́m/ or /mówst+ə̌v+ə̀m/, which perhaps contain different morphemic words.

The procedure followed involved both direct analysis of the corpus and, as a check, the marking of subjects by readers under certain instructions. The first step of the analysis was to identify the finite verbs and verb phrases. Next, the distinctive "subject" forms of pronouns were located and with two exceptions declared to be subjects. Their environments were noted--i.e., the preceding and following marked clause terminals, known classes, and unassigned forms (rarely compounds). The environments thus established were used to identify as subjects the pronouns without distinctive "subject" forms. From this point on, substitution of pronouns was used for morphemes and sequences (of morphemes), with the pronoun form determined by adding a reflex question wherever possible. Subjects were identified by environment if the replacing pronoun was it or you.

Excerpts A, B, E, and F had eight readers; C and D had six. The readers were instructed (1) to mark as subject the maximum stretch for which a single pronoun could be substituted, (2) to accept there as a subject in the formula there is, and (3) to ignore "non-restrictive material" between a subject and verb. The purpose of the second instruction was to avoid consideration of possible postverbal subjects. The third was given as a way both to avoid profitless disagreements and to make some disposition of material like that between commas in

Washington, it is considered in Madrid, has been (A 47)

It will be the practice to register disagreements (except omissions)[6] shared by two or more readers.

Finite verbs. Aside from the auxiliaries starred above, only those verbs are finite that belong demonstrably to the past tense or the nonpast. The two tense forms must be interchangeable (but without regard

for "the sequence of tenses")--e.g., was with am or is; break or breaks with broke. This criterion excludes command verbs and a very few such sequences as 'but why give him the build-up' (B). The corpus contains 577 finite verbs and verb phrases.

1.0 Pronouns.

1.1 Pronouns with distinctive subject forms. Examination of the pairs I/me, we/us, they/them, he/him, and she/her shows that in the corpus only the first member of each pair occurs as the single possible preverbal or postauxiliary subject--e.g., 'as he put' (C 30); 'did I wish' (F 36). Of 197 "subject" forms, 191 are preverbal, 4 postauxiliary, and 2 preverbal as parts of sequences which a single pronoun can replace--e.g., we for Prince and I in 'before Prince and I rounded' (E 69). The last two are not considered possible subjects because they are not maximum sequences. The rest will be called subjects; they form the basis for the rest of the analysis.

It is assumed that a pronoun never stands at the head of a nominal phrase--that is, that in 'The largest I ever weighed' (E 80), the first two forms are not modifiers of I. The same is assumed to hold for substitutions. If they is substituted for flags in 'Spanish flags were hung' (A 3), the result is Spanish they were hung, which is not normal English. It follows that if a noun preceded by an adjective can be replaced by a pronoun, the adjective does not form a phrase with the noun. This situation occurs in 'how much more liberal Spain is' (A 23), where it can replace Spain for an acceptable how much more liberal it is.

I, we, they, he, and she occur as subjects with the following immediate environments:

Preceding

Punctuation (comma, period, or the equivalent):
Stalin wrote the questions, they were (B 16)
Conservatives came to power. They have been (A 56)
Morphological noun:
they were exactly the questions he would have written (B 17)
Curtain. At this writing they have adopted (B 66)
Morphological verb:
The Russians always say they are (B 5)
noticed that as dusk approached he would become (E 97)

Syntactic adjective:
the ground. The largest I ever weighed (E 80)
Adjective + -ly:[7]
unless by accident. Lately we haven't heard (B 44)
Auxiliary:
officers. But what did they get (B 42)
although: or a party, although they realize (D 35)
and: as they are, and they enable (D 40)
as: and, so far as I know (B 12)
its control mechanisms, as he put (C 30)
because: from Winnington and Burchett because they could get (B 41)
before: fruitful solitude--but before he died (F 24)
but: British government circles. But they nourished (A 54)
for: the hounds' escape, for I could now hear (E 27)
if: an important man; if he wants (B 27)
he announced, as if I were (E 19)
often: us all. How often I have heard (F 95)
perhaps: to correct it. Perhaps he does not relish (E 25)
since: are commonly very welcome since they help (D 28)
so: to face, and so I came (F 46)
sometimes: returned from Korea that sometimes they had (B 39)
suppose: personal interest; or suppose they don't know (B 92)
than: be far more independent than they would be (D 41)
that: to be clearly established that they were (A 8)
then: yards or more; then he turned (E 52)
though: , educated and enlightened though he be (C 6)[8]
what: they had to use what they got (B 40)
when: $1,297,000. When we come (D 15)
where: will designedly lead them where he knows (E 43)
which: S. G. Goodrich, which I referred (C 1)
while: and did not wake while I furiously beat (C 45)
yet: to employ it. Yet we see (F 6)

Following

Morphological verb: then he turned aside, taking a (E 52)
Adjective + -ly: while I furiously beat the air with (C 45)
Auxiliary: but they can keep going indefinitely; (E 65)
ever: if he ever gets out. But (B 62)
just: And they just seem able to make (E 35)
never: that they never have to go far (E 34)
once: And I once saw a buck, (E 48)

1.2 Pronouns without distinctive subject forms. It and you are possible subjects at 46 points. The established environments identify 43 as subjects. The remaining 3 are:

and it now seems to be clearly (A 7)
to practice resignation, unless it were (F 37)
It almost seems as if a (F 64)

The underlined forms prevent identification.

The readers disagreed on one item:

$_1$(likeness which springs from pride ($_6$it)) is (F 8)

2.0 Demonstratives and uninflectable forms.

2.1 Advanced adjectives. Once apiece these and both, replaceable by they, are subjects. At ten points, that, this, and such, replaceable by it, are subjects identified by environment. These forms are all considered morphemically the same as those known to be adjectives in the nominal phrase. The rule is that advanced adjectives can be preceded only in accordance with the established order of classes or by non-adjectival modifers (e.g., all this, nearly all).

Examples of advanced adjectives from the corpus:

But this is by no means (A 19)
But that is not the kind (B 63)
These are formidable figures. (D 24)
Both proceed from the fact (F 10)
but such is the situation. (F 102)[9]

The readers disagreed on one item:

To others ($_5$this) must ($_3$all) seem (F 100)

2.2 Interrogatives and relatives. What, which, who, and that occur 39 times as possible subjects. For this set, pronoun substitution is weak at best, and environment backed by substitution from within the set is far better. What, which, and who appear 9

times in the environment Punctuation ____ Finite verb. Perhaps the subject is postverbal in 'What is life' (F 107) (cf., "What are lives"), but this paper identifies it as a subject by environment along with the other eight. One apparently established environment would be rejected in a full analysis, but here no discrimination seems technically available:

enemy lines, but for what was going (B 37)

One further identification can be made if they is accepted as a substitute for who in

not against the Spaniards, who also occupy (A 12)

They is not formally inconsistent, and the identification is here accepted.

That is identifiable as a subject because in all but one instance-- 'the officeholders and the party that ignore' (D 73)-- it can be replaced by which or who. This possibility of replacement is the characteristic which, in the absence of stress marking, differentiates the relative that from the advanced adjective.

With high probability, all 39 possible subjects of this type are identifiable. They add one item to the environments:

Following

also: Spaniards, who also occupy a good chunk (A 12)

Readers disagreed on two subjects:

enemy lines, but (^{2}for (^{6}what)) was going (B 37)
grubstaked the candidates. (^{2}Those (^{4}who)) feel (D 82)

Coordinatives. In the corpus, and, or, and comma punctuation occur as coordinatives at least between words and phrases. Before going further, it is necessary to estimate the part they play in subjects. One of their major characteristics is that they act as pivots for the words and phrases they are between. It is essential to know the limits of the pivoting morphemes or sequences. For example, in 'an adequate national radio and television program' (D 18), presumably television

program is a compound in the derived speech of most readers, yet it cannot be pivoted to produce "television program and radio." The proper pivoting seems to be to "television and radio program."[10] Again, in 'These men and women help' (D 38), the pivoting is not to "women and these men," but to "these women and men."

Wherever less than a maximum subject sequence is involved in the pivoting, it is pointless to make distinctions here. Both examples cited might as well be treated as nominal phrases. So also might the occurrence of or in 'a candidate or party may spend' (D 93). However, this should not obscure the difficulty that a single pronoun cannot be substituted for the sequence before may. With words or phrases pivoting on or and but (and perhaps sometimes on and and comma punctuation), either the verb must be said to have two or more subjects or a special dispensation must be issued.

3.0 Nominal phrases. For convenience, morphological nouns, nominal compounds, and partially coordinated phrases are included here with the standard phrase. The corpus has 148 occurrences--91 identifiable by the pronoun replacement, 52 by environment, and 5 unidentifiable by the methods used here. Sometimes the text must be consulted for the appropriate substitute. For instance, the passage 'I waited until the hound came up. He got hog scent and deer scent all mixed up' (E) makes it clear that for this text the replacement for hound is he. If the text contains no clues ('My independent committee found'--D 55) or if the evidence is inconsistent ('how much more liberal Spain is in its official dealings,' 'Spain feels herself to be'--A 23, 36), environment is relied on for identification. In a sequence discussed earlier, 'on the total amounts which a candidate or party may spend' (D 93), the replacement for candidate puts the subject among those identifiable by form.

The 91 subjects identifiable by the form of the replacement add the following items to the environments:

	Preceding
not:	others. Whether or not Stalin wrote (B 15)
now:	dimensions of truth. Now my husband, . . . , may be described (C 7)
once:	a change of policy once the Conservatives came (A 55)
until:	further. I waited until the hound came (E 54)

wherein: American literature is that wherein Thoreau gives (F 29)
why: . I don't know why the American delegate abstained (B 72)

Following

always: The Russians always say they are for (B 4)
as: Deer as a rule never run far (E 61)
neither: which man neither can nor is expected (C 10)
not: that the big contributors not only get their money (D 77)
often: The Negroes often found names for their (E 113)
still: Some papers still follow that practice; (B 86)
thus: ; their inhabitants thus hoped for protection against (A 4)

The underlined forms prevent identification by environment in the following 5 stretches:

worth taking and that only a bold policy can now prevent (A 45)
that innocuous declaration, unless the reason was (B 73)
finance a campaign. Even the bookkeeping comes (D 54)
bookkeeping comes high. Thus my independent committee found (D 55)
into a description of how the universe came (F 68)

The only of A 45 and the even of D 54 are not considered adjectival modifiers because either of them may precede the full nominal phrase, all the five good young men.

The readers disagreed on the following items:

that ([2]only ([6]a bold policy)) can now suffice (A 45)
--([1]a project ([2]which)) ([5]the President) was known (B 10)
([3]As a naturalist ([3]Karl)) took (C 76)
when ((my foreman[4]), Prince,[4]) thrust (E 16)

The minority markings of B 10 seem totally unaccountable; the inclusion of As a naturalist in C 76 strikes the writer as curious and based on semantic interpretation; the inclusion of Prince in E 16 probably means that the pair of commas was ignored in derived speech.

4.0 Non-finite verbals. One marked infinitive (plus following material) and one Ving are possible subjects:

To curry favor in this way with the Arab world has (A 41)

Voting is merely the start (D 86)

It is considered the replacement; both environments have been established.

5.0 Subsentences. The corpus contains two subsentences as possible subjects, both marked by the interrogative/relative what, and both identifiable:

, what he says is known (B 79)
that what Prince said is (E 22)

The replacement is it, and the environments have been established.

Both here and later in the paper a subsentence is defined as a sequence which has a finite verb and which is marked by a relative at or near its beginning. A Ø is a marker if it alternates within the set of relatives.

6.0 Sequential subjects. Forms and constructions of the kinds so far described as subjects are sometimes included in longer sequences which a single pronoun can replace. The infinitive in section 4 (A 41) might possibly be called a sequential subject in contrast with "To err is human." It was excluded from the present class because the postinfinitive material seemed on inspection like postverbal material.

A tentative definition of preposition is needed in advance: An uninflectable and so far unidentified form intervening between forms or sequences of types already described.

In this section the following abbreviations will be used:

1.1 MP	Pronoun with marked subject form
1.2 UP	Unmarked pronoun
A	Adjective
2.1 AA	Advanced adjective
2.2 R	Interrogative/relative
3.0 N	Nominal phrase
4.0 Inf.	Marked infinitive
4.0 Ving	Base form + -ing
5.0 SS	Subsentence
P	Preposition

6.1 Sequential subjects, I: N + N

One sequence is a possible subject:

that the great French poet Paul Valéry, . . . , tells (F 78)

The replacement he identifies the sequence as a subject.

6.2 Sequential subjects, II: $\left.\begin{matrix} AA \\ N \\ Ving \end{matrix}\right\}$ + A (+)

Five sequences are possible subjects:

that the religious ideas current in America are (F 11)
if a poetry . . . [sic] suitable to the human soul were (F 65)
which one alone cannot remove (F 115)
Printing alone would probably cost (D 5)
My husband and I each have (F 97)

In this group the underlined sequences of F 11 and F 65 are immediately identifiable as subjects, the first by substitution and the second by environment. The underlined sequences of the remaining three can be called subjects only if a single pronoun can in each instance replace the whole sequence. If so, all are identifiable. But because of he (she, it) alone and we each, the maximal limit of pronoun substitution is in doubt, as disagreements among the readers testify. With full recognition of the dubiousness of the position, alone is taken to be part of the possible subject. Since there seems to be no reason to analyze each differently, all three are included with the identified subjects.

Disagreements among the readers ran as follows:

((Printing^{2}) alone^{4}) would probably cost (D 5)
(^{2}that (^{6}the religious ideas current in America)) are (F 11)
((My husband and I^{4}) each^{4}) have (F 97)
(^{1}which [(^{2}one)) alone^{5}] cannot remove (F 115)

6.3 Sequential subjects, III: (a) N + Inf.

One sequence is a possible subject:

But the really hard nuts to crack are (A 50)

The replacing they identifies the subject.

(b) N + Ving (+)

Two sequences are possible subjects:

Here the committee backing the Republican candidate admitted (D 12)

Committees supporting him and other Republican candidates spent (D 14)

The here prevents identification of a subject in D 12. The subject of D 14 is formally ambiguous, since either him or Committees... him may pivot on and: Committees supporting him and them or they and they. The underlined sequence is unquestionably a subject, but its assignment to this type is debatable.

6.4 Sequential subjects, IV: $\left.\begin{matrix} N \\ AA \end{matrix}\right\}$ + R + SS

The relatives within possible subjects in the corpus are who, which, that, and Ø. Except for their subjects, the material within the subsentences is left unanalyzed. Twelve sequences are possible subjects, all identifiable by pronoun replacement or by environment.

At least two readers disagreed in common about 5 items:

that ((the information^2) the public receives^6) is (B 70)

[that (((men^1) who talk on one side^2) or on both^3)^1] are known (B 91)^{11}

that ((the low slicing dive^2) which fans his cheek and lifts his hair^4) is (C 27)

from it ((fine steaks^3) that taste somewhat like halibut^5) can be cut (E 3)

((The obstacles^3) which the heart meets with^5) are (F 114)

Two further examples are given to show the advanced adjective and the greatest apparent complexity within the subsentence:

Those who feel distressed by what I have outlined can help (D 84)

--a man who knows that his picture is going to be printed in the American papers where his family will see it wants (B 52)

The second example may illustrate a tacit assumption that if it were

the subject of wants, a clause terminal would be marked after see.

This type of subject adds a class to the environments:

Preceding

Pronoun: from it fine steaks that taste somewhat like halibut can be cut (E 3)

6.5 Sequential subjects, V:

$$\left.\begin{matrix}\text{AA}\\ \text{N}\\ \text{Ving}\end{matrix}\right\} + \text{P} + \left\{\begin{matrix}\text{MP}\\ \text{mine}\\ \overline{\text{R}}\\ \text{N}\ (+\ \text{P} + \left\{\begin{matrix}\text{N + P + N + P + N}\\ \text{R + SS}\end{matrix}\right\})\\ \text{N + A}\\ \text{Ving}\end{matrix}\right.$$

Forty-nine sequences are possible subjects, with as, at, for, from, in, of, on, to, towards, with, and within appearing as prepositions. Examples follow:

AA + P + MP: but most of them, . . . , have accepted (B 87)
AA + P + R: , most of whom had come (A 5)
AA + P + N: but some of the Americans were (B 34)
AA + P + N + P + N: Another of the most famous pages in American literature is (F 28)
N + P + MP: that their interest in him may be divided (E 45)
N + P + mine: These dogs of mine will not only run (E 28)
N + P + R: , the costs of which are constantly increasing (D 9)
N + P + N: The Spanish colony in Tangier denied (A 6)
N + P + N + P + N + P + N + P + N: While an estimate of total campaign costs at all levels of government in a presidential year has (D 21)
N + P + N + P + R + SS: Reports of our unusual number of what Mr. Goodrich describes as "one of the most remarkable groups in animated nature" began (C 61)
N + P + N + A: if the expenditures of both parties together were (D 23)
N + P + Ving: The thought of actually exterminating four thousand bats, . . . , was (C 81)
Ving + P + N: Reporting of the Korean war has in general been (B 28)

All 49 sequences of this type are identifiable as subjects, 24 by pronoun replacement and 25 by environment.

They add one pair of forms to the environments:

	Following
too often:	but the practices of the American news business--...--too often give us only (B 81)

The readers were in disagreement as follows:

claimed ((2)that ((6)the problem of the Spanish occupation)) will be easily settled (A 16)
, ((the Spanish Minister of Foreign Affairs(4)), Martin Artajo, (3)) made (A 29)
but ((the practices of the American news business(6))--practices adopted in a praiseworthy ambition to be objective--(2)) too often give (B 81)
((The thought of actually exterminating four thousand bats(2)), not just driving them away, (4)) was (C 81)
((What student(2)) at the height of a lofty argument(6)) has not been heard (F 98)

The second and third look simply contrary to instructions about material encased by commas. The fourth is probably an effect of the use of comma punctuation as a coordinative, but for the moment it must be ignored. The last is formally ambiguous in edited English, since the absence of punctuation does not rule out clause terminals in derived speech.

7.0 Coordinated subjects. Eight stretches that include coordinatives are possible subjects in pairs or series. The arrangement for pairs is: N and $\begin{cases} MP \\ N \end{cases}$; for series, with one exception: N, N, and N. Examples follow:

before Prince and I rounded (E 69)
, Franco and his advisers did not expect (A 53)
that reporters, editors, and commentators shall do (B 68)

The exception is analyzed as a series of three sub-subjects, if such a term is permissible:

The costs of headquarters, meetings, travel, the salaries of publicity men and clerks, postage, mailing, telephone and telegraph bills, will absorb (D 7)

Sub-subject A: The costs of headquarters, meetings, travel
(N + P + N + , + N + , + N)
Sub-subject B: the salaries of publicity men and clerks
(N + P + N + and + N)
Sub-subject C: postage, mailing, telephone and telegraph bills
(N + , + Ving + , + N)
Subject: A + , + B + , + C (+ ,)

The marked clause terminal after C suggests that terminals may be overt in this position if only comma punctuation has been used as a coordinative. If so, one subject registered in section 6.5 should be reanalyzed as N + P + Ving + , + Ving:

The thought of actually exterminating four thousand bats, not just driving them away, was (C 81)

Such a revision would bring the analysis into accord with the judgment of the majority of the readers.

All 8 coordinated sequences are identifiable as subjects by pronoun replacement. They add one item to the environments:

Following
herein: , ((his bravery and his abhorrence[4]) herein[2]) reached (C 9)

This is also the only stretch about which the readers disagreed.

Remaining finite verbs. There remain 55 finite verbs for which no subjects have been considered. Superficial inspection shows that 37 of these are second or later members of pairs or series. The formula there is accounts for 13, here is for 2, and ; so, too, can hounds (E 66) for 1 more. These 16 can be analyzed as having postverbal subjects. The 2 left are:

, as was shown in the case of President Truman, (A 48)
but those editorials were read by far fewer people than saw the statement itself (B 23)

Miscellaneous. Two or more readers marked ten subjects where the following verb form is not finite:

we have let ([2]the enemy) slip a few fast ones past us (B)
written so as to make ([2]his side) look good (B)
and let ([1]the ([1]reader)) make up his mind (B)
([5]Woe) betide the officeholders and the party (D)
I once saw [-[1]a ((buck=][1]), weary after a long chase, [1]) fall in behind (E)
I have heard ([5]people) say (F)
--((many[1]) of them[1]) taken by an American (B)
Then the wastebasket would be inverted over it, ([5]the cookie tin) slipped under it, and ([6]the whole) borne hastily (C)
--([2]some of it), such as Homer Bigert's dispatches in the early months to the New York Herald Tribune, exceedingly good; (B)

	Tabulation						
	A	B	C	D	E	F	Total
Identified Subjects:							
1.1 Marked pronouns	4	28	25	35	66	37	195
1.2 Unmarked pronouns	5	8	5	5	7	13	43
2.1 Advanced adjectives	3	2	1	1	--	5	12
2.2 Interrogative/relatives	5	8	7	7	4	8	39
3.0 Nominal phrases	19	27	21	18	29	29	143
4.0 Non-finite verbals	1	--	--	1	--	--	2
5.0 Subsentences	--	1	--	--	1	--	2
6.1 Sequentials, I	--	--	--	--	--	1	1
6.2 Sequentials, II	--	--	--	1	--	4	5
6.3 Sequentials, III	1	--	--	1	--	--	2
6.4 Sequentials, IV	2	3	1	2	2	2	12
6.5 Sequentials, V	10	7	6	15	7	4	49
7.0 Coordinated subjects	1	1	3	2	1	--	8
	51	85	69	88	117	103	513
Unidentifiable subjects:							
1.2 Unmarked pronouns	1	--	--	--	--	2	3
3.0 Nominal phrases	1	1	--	2	--	1	5
6.3 Sequentials, III	--	--	--	1	--	--	1
	2	1	--	3	--	3	9
No preverbal subjects:							
Pairs and series	2	3	19	2	8	3	37

No preverbal subjects: cont.	A	B	C	D	E	F	Total
there is	—	3	2	4	--	4	13
here is	--	--	--	--	--	2	2
so, too,	--	--	--	--	1	--	1
Other	1	1	--	--	--	--	2
	3	7	21	6	9	9	55
Totals:	56	93	90	97	126	115	577

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1. Cf. C. C. Fries, The Structure of English (Harcourt, Brace: 1952), pp. 10-11.

2. A. A. Hill, "Formal Characteristics of English Auxiliary Verbs," (unpublished), pp. 2 and 6. Comment on the list, including starring, is entirely my responsibility. I owe Professor Hill a debt of thanks for allowing me to read his analysis.

3. See G. L. Trager and H. L. Smith, Jr., An Outline of English Structure (Studies in Linguistics: Occasional Papers 3), 1951, pp. 77-80; Fries, op. cit., pp. 90-91.

4. Westbrook Barritt, Modifiers in English (University of Virginia dissertation, unpublished: 1952).

5. As morphemic word is defined in Trager and Smith, op. cit., p. 56.

6. In the sequence 'as dusk approached,' not a single one of eight readers marked a subject!

7. The class does not need to be identified for this paper.

8. The form be is registered as finite because of the alternant were.

9. This item is somewhat dubious because of such are the situations. However, such was marked as a subject by six of seven readers (one of the eight omitting). The dissenting reader marked the post-verbal the situation.

10. The appeal to semantics here seems inescapable.

11. The original has parentheses: 'on one side (or on both).' They are considered equivalent to commas, and hence the encased material is not registered as part of the subject.

ON THE ETYMOLOGY OF WELSH BAW "FILTH, MUD, EXCREMENT"

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Criticism has frequently been heaped upon Welsh etymologists for attempting to find Indo-European sources for Welsh words for which Goidelic cognates are lacking. Joseph Loth, for example, in his scathingly brilliant Remarques et additions à la Grammaire galloise historique et comparée de John Morris Jones (Paris, 1919) condemned that scholar, whose flights of etymological fancy are by now notorious, for attempting to proceed directly from Welsh to Indo-European without the support of Goidelic, which Loth deems parallel to leaping from French to Indo-European with no intermediate stopping place. The point could be argued on the basis of the relative conservatism of Welsh and French, but, apart from that, the etymology of a Welsh (or Cornish or Breton) word having no recognized cognate in Irish does not have to be achieved by such a prodigious leap as that assumed by Loth and those sharing his attitude. If there were no Goidelic at all, it would be possible to offer, with a reasonable degree of plausibility, etymologies for a considerable portion of the Welsh vocabulary. It would require no great temerity, for instance, to suggest cognates for brawd "brother", cant "hundred", or halen "salt", even if no Irish cognates existed, any more than the absence of Brythonic cognates deters us from pointing out the IE preforms of Old Irish māthir "mother" or ath(a)ir "father". It is admitted that rather transparent examples have been adduced here, but the principle is justified. Moreover, the cognates of these words in other, non-Celtic languages are certainly intermediate steps on the way to Indo-European. If, then, Welsh etymologies are to be rejected, it should be on the grounds of faulty proof, semantic and phonological, rather than because of the fortuitous non-existence of an Irish cognate.

A word which has not been satisfactorily explained in Welsh is baw "filth, mud, excrement". It seems to have no immediate cognates in other Celtic languages, although G. Dottin, La Langue Gauloise (Paris, 1918) 232 considers French boue "dirt, mire, filth" to be of Celtic origin, presumably Gaulish, although there is no known Gaulish word that is cited as the source. There seems, nevertheless, to be a clear Indo-European origin of the word baw: *g^{w}ōw-/g^{w}ēw, the source of such Germanic words as OHG quāt, NHG Kot, OE cwēad "dung"; cf. also Russian Church Slavic govno "dung", Czech o-havný "disgusting", Sanskrit gūtha-s "dung, filth" (from *g^{w}əw- or the result of later

manipulation in Sanskrit, as is often the case with Sanskrit ī, ū, a fact pointed out to the writer by André Martinet). For other cognates, see Pokorny, Indogermanisches Etymologisches Wörterbuch, 484-5, including, in Welsh itself, the adjective budr "dirty" (with *ə̄u). But most striking indeed is the IE base posited by Pokorny for the word "cow": *g^{w}ow- (Skt. gāus, Gk. boũs, Old Irish bō [from *bāu, IE *g^{w}ōws] "cow"). It seems fairly clear that the word for excrement is of the same origin as this word for "cow", cf. the remarks of Joshua Whatmough in his review of Pokorny, Language 28(1952) 266, where he specifically designates CS govno 'excrement' as connected with the words for "cow, bull". The long vowel of *g^{w}ōw- is then to be regarded as the lengthened grade of the nominative with analogical extension to the oblique cases (for which point the writer is, again, indebted to André Martinet). And French boue, which Dottin thought to be from Celtic (probably following Diez?) is most likely of Romance origin after all, being some sort of derivative of Lat. bos, bovis and meaning originally "cow dung".

A PROBLEM IN PHONEME IDENTIFICATION WITHOUT DIFFERENTIAL MEANING

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1. Bernard Bloch has, in at least three separate attempts, been searching for an objective definition for contrast between sounds on the basis of distribution alone, thus eliminating differential meaning from phonemics. In the last attempt[1] he admits the weaknesses of the previous statements, and tries to tidy up the postulates where criticism has centered -- those dealing with distribution (Lg. 24.22-26). These are replaced with a single postulate and a new set of definitions are a useful sharpening of terminology, and the postulate is certainly a simplification over the six which it replaces. Although Bloch's postulates are not intended as guides to field procedure, but as theoretical foundation only, we shall test to see where the application of the new postulate to a problem in Kamhmu?[2] phonemics leads us. We will, in general, use Bloch's terminology, and indicate the source and definition of that terminology by a reference in parentheses after the first appearance of each term.

2. We have symbolized perceptually differing qualities (Lg. 26.89) in traditional fashion, and have indicated aspects of duration (Lg. 24.20) by [:] and [::] placed after the symbol of quality. We describe the range (Lg. 24.30) of a segment in terms of a disjunction (Lg. 24.13) A...C in which A refers to the set of segments which occur immediately preceding our segments in question and C to the set of segments (or no segment) following. A very pertinent part of our range also is stress.[3] We do not include pitch in the discussion of range because our illustration would then get out of hand in complexity. Instead, we restrict all of our material to one pitch contour, a low-rising pitch. The choice of most other pitches would not change any details of our description.

We now indicate the terms which we will use in our general definitions (Lg. 29.59-60) of ranges. Stress or stressed will refer to any one of three degrees of stress [˝, ˊ, ˋ]; zero stress or unstressed will refer to a fourth degree [˘] (or unmarked). The value of other terms may be taken from the following table of phones which is not complete, but gives what is relevant to this problem.

	bilab.	alv.	pal.	vel.	glot.
vl. stops	p	t	c	k	ʔ
vd. stops	b	d	ɟ	g	
vl. nasals	M	N	Ñ	ŋ	
short vd. nasals	m	n	ñ	ŋ	
long vd. nasals	m:	n:	ñ:	ŋ:	
non-syllabic short vd. vocoids	w		y		
non-syllabic long vd. vocoids	w:		y:		
vl. vocoids	W		Y		h
short vd. lateral		l			
long vd. lateral		l:			
vl. lateral		ɬ			
short vd. trill		r			
long vd. trill		r:			
voiceless trill		R			
sibilant		s			

Short segments will refer only to those segments paralelled by others of the same quality but having an aspect of duration. (i.e., it does not refer to p, t, k, etc.). Short high close voiced vocoids refers to [i, ɨ, u], and long high close voiced vocoids to [i:, ɨ:, u:].

One particular set of ranges can be defined once-for-all as A′ ... C′, in which A′ consists of any non-vocoid, any non-syllabic vocoid, or any vl. vocoid, and C′ of any vl. stop, vd. nasal, non-syllabic vd. vocoid, [h], or zero.

The allophones which we have chosen for this problem are selected simply on the basis that they are all the allophones which comprise certain phonemes of the language, as determined by a previous analysis. Our purpose is to determine whether the postulate of Lg. 29.59 will bring us the same or different results in terms of phonemes. The allophones, with their ranges, are stated in general definition as follows. The statements before the first semicolon indicate the stress with which each allophone occurs; those before the second semicolon indicate A; those before the third indicate C. The range of a given allophone is the total of these.

[a] stressed or unstressed; A′ ; C′ less pal. (i.e., C′ as defined except for pal.).

[a:] stressed; same as for [a]; same as for [a].

[a::] stressed; A´ ; C´ less pal. and less short vd. segments.
[a$^{\top}$] unstressed; A´ ; pal. vl. stop or pal. vd. nasal.
[a$^{\top}$:] stressed; A´ ; same as [a$^{\top}$].
[a$^{\top}$::] stressed; A´ ; pal. vl. stop or long pal. vd. nasal.
[a$^{\vdash}$] stressed or unstressed; A´ less pal. and less alv. when C is pal; alv. non-lateral, or pal.
[a$^{\vdash}$::] stressed; same as for [a$^{\vdash}$]; same as [a$^{\vdash}$] less vd. short segments.
[a$^{\vdash\perp}$] stressed or unstressed; pal., or alv. (not lateral or nasal); alv. when A is pal., and pal. when A is not pal.
[a$^{\vdash\perp}$ ::] stressed; same as [a$^{\vdash\perp}$]; long alv. non-lateral non-nasal when A is pal., long pal. when A is not pal.
[$\wedge$] stressed or unstressed; A´ less pal; bilab. or vel.
[$\wedge$::] stressed; A´ less pal; bilab. or vel. except short vd. segments.
[$\wedge^{\perp}$] stressed or unstressed; pal; bilab. or vel. Or stressed or unstressed; bilab. or vel; alv. nasal. Or stressed; high close vd. vocoid; C´.
[$\wedge^{\perp}$::] stressed; same as for [$\wedge^{\perp}$]; same as for [$\wedge^{\perp}$] less all short vd. segments.
[ɑ] stressed or unstressed; A´ ; vd. laterals.
[ɑ::] stressed; A´ ; long vd. lateral.
[ə] unstressed; for A and C total ranges of [a$^{\vdash\perp}$], [a$^{\vdash}$], [$\wedge$], [ɑ], [$\wedge^{\perp}$]; Or unstressed; A´ ; glot. and zero.

The comparison of the above allophones, pair by pair, for their respective communis and propria (Lg. 29.60) is then possible, and for each pair a general definition results. Using semicolons as above, we now give three examples. By definition the range is the total of stress; A; C; so that if an allophone has a communis or propria with another allophone in respect to any of these it has a communis or propria in its range.

[a, a$^{\top}$::]. Propria of [a]: [$^{\smile}$]; none; any vl. stop or vd. nasal except pal., and any non-syllabic or [h]. Propria of [a$^{\top}$::]: none; none; pal. vl. stop and long pal. vd. nasal. Communis: none. The allophones are therefore in complementary distribution and are non-contrastive (Lg. 29.60).

[a, a$^{\vdash}$]. Propria of [a]: none; pal. and alv. when C is pal; C´ less pal. and alv. non-lateral. Propria of [a$^{\vdash}$]: none; none; pal.

Communis: stress; A′ less pal. and less alv. when C is pal; alv. non-lateral. The allophones are therefore in overlapping distribution (Lg. 29.60) and because the communis of their ranges can be distinguished from either propria by a general definition, they are non-contrastive.

[a, a::]: Propria of [a]: [ˇ]; none; short vd. segments. Propria of [a::]: none. Communis: stress; A′; C′ less pal. and short vd. segments. The allophones are therefore in incorporating distribution (Lg. 29.60) and because the communis of their ranges can be distinguished from either propria by a general definition, they are non-contrastive.

Of the 136 pairs of allophones produced by comparing each allophone above with each other allophone, the following are in complementary distribution: [a and a:] with [a$^{\top}$, a$^{\intercal}$:, a$^{\intercal}$::]; [a::] with [a$^{\intercal}$, ə]; [a$^{\intercal}$] with [a$^{\intercal}$:, a$^{\intercal}$::, a$^{\vdash}$::, a$^{\vdash\perp}$::, ʌ::, ʌ$^{\perp}$::, ɑ::, ə]; [a$^{\intercal}$: and a$^{\intercal}$::] with [ʌ::, ɑ, ɑ::, ə] and [a$^{\intercal}$::] with [a$^{\vdash}$:, ʌ]; [a$^{\vdash}$, a$^{\vdash}$::, a$^{\vdash\perp}$, and a$^{\vdash\perp}$ ::] with [ʌ, ʌ ::, ɑ, ɑ::]; [ʌ and ʌ::] with [ɑ, ɑ::]; [a:, a$^{\vdash}$ ::, a$^{\vdash\perp}$::, ʌ::, ʌ$^{\perp}$::, and ɑ::] with [ə].

The following are in overlapping distribution: [a and a:] with [a$^{\vdash}$, a$^{\vdash}$::, a$^{\vdash\perp}$, a$^{\vdash\perp}$::, ʌ, ʌ$^{\perp}$, ʌ$^{\perp}$::], [a] with [ʌ::], [a:] with [ɑ]; [a::] with [a$^{\intercal}$:, a$^{\intercal}$::, a$^{\vdash}$, a$^{\vdash}$::, a$^{\vdash\perp}$, a$^{\vdash\perp}$::, ʌ, ʌ$^{\perp}$, ʌ$^{\perp}$::, ɑ]; [a$^{\intercal}$] with [a$^{\vdash}$, a$^{\vdash\perp}$, ʌ, ʌ$^{\perp}$, ɑ]; [a$^{\intercal}$:, a$^{\vdash}$, a$^{\vdash}$::, and a$^{\intercal}$::] with [a$^{\vdash\perp}$, a$^{\vdash\perp}$::, ʌ$^{\perp}$, ʌ$^{\perp}$::], [a$^{\intercal}$:] with [a$^{\vdash}$, a$^{\vdash}$::, ʌ], [a$^{\intercal}$::] with [a$^{\vdash}$]; [a$^{\vdash\perp}$, a$^{\vdash\perp}$::, ʌ, ʌ::, a], a::] with [ʌ$^{\perp}$, ʌ$^{\perp}$::]; [a$^{\vdash}$, a$^{\vdash\perp}$, ʌ, ʌ$^{\perp}$, and ʌ$^{\perp}$::] with [ə].

The following are in incorporating distribution: [a] with [a:, a::, ɑ, ɑ::, ə]; [a: and a::] with [ʌ::, ɑ::], [a:] with [a::]; [a$^{\intercal}$:] with [a$^{\intercal}$::]; [a$^{\vdash}$] with [a$^{\vdash}$::]; [a$^{\vdash\perp}$] with [a$^{\vdash\perp}$::]; [ʌ] with [ʌ::]; [ʌ$^{\perp}$] with [ʌ$^{\perp}$::]; [ɑ] with [ɑ::].

All pairs are non-contrastive, those in complementary distribution by definition, and the others by virtue of the fact that the communis can be distinguished from either propria by a general definition. A class of non-contrastive and phonetically similar phones is a phoneme (Lg. 26.90), so the listed items therefore constitute a single phoneme /a/.

We now proceed to write some of our data phonemically, all with the same intonational contour, a low-rising pitch: /pát/ [pá:t] 'to slice';/pát/ [pá::t] 'yes! slice!'; /pát/ [pá˘t] 'duck'; /pát/ [pá˘::t] 'yes! a duck!'. Thus, when glosses are added to the examples the nonsense of considering the allophones "non-contrastive" becomes immediately apparent. The amount of free variation of some of the phones in restricted environments (as between [a] and [a:] before [ʔ] and [h]), the fact that an intonational or junctural extra lengthening of vowel and syllable-final voiced consonant may occur on (morphophonemically) long and short vowels alike, making them phonetically the same length, the fact that ranges are statable in general terms at least when the disjunction is consistently considered to be degree of stress and A...C, and that morphophonemic length is reduced in unstressed position, all combine to present what seems to the author to be a hopeless reductio ad absurdum of Bloch's suggestion.

The above description would have been simpler and somewhat different if we had written syllable boundaries and included them in our ranges (making the ranges slightly larger). The difference would have been a larger number of pairs of allophones in complementary distribution, which would not have changed the conclusions whatsoever. We did not include syllable division because Bloch did not.[4]

We would like to extract a feature (Lg. 24.33) of "extra length" but we have no basis for doing so if differential meaning is excluded. If we did it arbitrarily we would then get two phonemes /+/ [::] and /a/ [everything else]. That would be an improvement, but still at variance with the pattern we get with differential meaning. Other arbitrary solutions would be to abstract the second [:] in [::], or abstract [::] when it is not matched on a given quality with [:] and the second [:] of [::] when it is, or abstract as in any of the above arbitrary solutions plus length on a following long segment, if any. But even if all the "correct" (in terms of differential meaning) arbitrary decisions were made the result would still be only two phonemes, /+/ and /a/, not enough to represent the actual meaning contrasts.

3. An analysis of the problem, using differential meaning, with all statements applying only within syllable boundaries, follows:

/+/ [::] extra length on /a/ and on vd. segments following in the same syllable.

[:] extra length on /a:/ and on vd. segments following in the same syllable.

/a/ [a] ~ [a:] before /?, h/ or zero in the same syllable, stressed.

[a] in [a::] /a+/ same as immediately above.

[a$^{\vdash}$] stressed or unstressed; before pal. and /t,n,r/; after non-pal., and after non-alv. when the following segment is pal.

[a$^{\vdash}$] in [a$^{\vdash}$::] /a+/ as immediately above, but stressed only. (Note that /+/ implies length on any following vd. segment as well as on the preceding segment.)

[a$^{\vdash\perp}$] stressed or unstressed; between a pal. and an alv. (except laterals).

[a$^{\vdash\perp}$] in [a$^{\vdash\perp}$::] /a+/ as immediately above, but stressed only.

[ʌ] stressed or unstressed; before a bilab. or vel; after any consonant segment except pal.

[ʌ] in [ʌ::] /a+/ as immediately above, but stressed only.

[ʌ$^{\perp}$] stressed or unstressed; before bilab or vel; after pal. Or, stressed or unstressed; before an alv. nasal; after a bilab. or vel. Or, stressed; before any consonant or zero and after /i, ɨ, u/.

[ʌ$^{\perp}$] in [ʌ$^{\perp}$::] /a+/ same as immediately above, but stressed only.

[ɑ] stressed or unstressed; before laterals.

[ɑ] in [ɑ::] /a+/ as immediately above, but stressed only.

[ə] ~ each of [a$^{\vdash\perp}$, a$^{\vdash}$, ʌ, ɑ, ʌ$^{\perp}$, a] in unstressed position.

/a:/ [a] unstressed except before pal.

[a:] stressed except before pal.

[a:] in [a::] /a:+/ as immediately above.

[a$^{\top}$] unstressed before pal.

[a$^{\top}$:] stressed except before pal.

[a$^{\top}$:] in [a ::] /a:+/ as immediately above.

The examples given before are now transcribed: /pá:t/ [pá:t] 'to slice'; /pá:t+/ [pá::t] 'yes! slice!'; /pát/ [pá$^{\vdash}$t] 'duck'; /pát+/ [pá$^{\vdash}$::t] 'yes! a duck!'.

4. In attempting to solve the problem through use of Bloch's new postulate not all the possible disjunctions have been used and tested. That which "turns out to be the most useful in comparing the environments of different segments" is called for (Lg. 24.22). Postulates to cover the choice are not given, but we are told that it would be possible to frame them (fn. 21). Useful for what? The phonemicizatio

reached in the first solution above is perfectly useful. It fills the definition of the phoneme in Lg. 24.5 (with complementary distribution and free variation, of course defined in terms of the postulate used here, not in terms of contrastive meaning). The only objection to this "useful" phonemicization is that what we know by meaning is at variance with our results.

We could take a disjunction AB...D, another A...CD, another AB...DE, ABC...E, ABC...EF, etc., until we had reached the beginning and end of every utterance, or until we had reached some arbitrary maximum of (say) fifteen segments preceding and fifteen following. Each disjunction would have to be worked out in turn and compared with all the others for usefulness. It is interesting that in none of Bloch's examples of disjunction is there one larger than a morpheme or a word, but we could not let such boundaries stop us for they are grammatical.

As the size of the disjunction increases, difficulties are enlarged more than simply the increased number of environments. Data will have to approach the total of all possible utterances in the language. We may reach all the combinations possible in the disjunction A...C with a relatively small corpus, but the combinations required in everything up to ABCDEFGHIJKLMNO...QRSTUVWXYZABCDE would be well-nigh exhaustive. The larger the disjunction the more environments which would have to be listed rather than given by general definition, and therefore the greater number of phones in contrast by the postulate. I suspect that most of the phones of our problem would be then in contrast, giving us a "usefully" large number of phonemes to compare with the "usefully" small one phoneme arrived at above.

Somewhere between we might come to an approximation of the analysis arrived at in our second solution (using differential meaning), but we could not possibly know when that point was reached.

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1. In Lg. 29.59-61. Fns. 1 and 2 give other relevant references.

2. A Palaung-Wa language (see pp. 280-283 in Anthropology Today, Chicago 1953) which the author studied in North Laos from 1950 to 1953.

3. On abstracting stress from the segment see Lg. 24.33.

4. Lg. 24.41. In Lg. 26.90 Bloch uses the syllable (which has there a different phonetic nature than the Kamhmu ʔ syllable) but offers no postulates to cover this use.

LATIN LENITION AND ITALIAN CONSONANTS

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Fairly recently A. Martinet pointed out in a very important article[1] that Latin, Oscan and Umbrian consonants underwent during their early history a general weakening process which was then followed by a general strengthening. Many developments in the Italic dialects become more comprehensible in the light of Martinet's theory. For instance, Proto-Italic -th- weakens to -θ- in Latin as well as in Osco-Umbrian, but in Latin it also voices to -ð- and joins the d-phoneme, while in Osco-Umbrian it passes in the weakened state to -f-. Thus Latin Aediniis corresponds to Oscan Aeifineis. Examples for the purely internal Latin evidence of the weakening process are the loss of the stop element in forms like venio<guenio* or maior<magios*.

One of the results of the early Latin lenition in Italian consonantism has recently been discussed by the author of this article.[2] During the period of lenition the Latin voiced stops were pronounced in a relaxed manner and were thus actually b̥, d̥, g̥, perhaps β̞, ð̞, ɣ̞. When Latin u̯ became a consonant it thus quite automatically joined Latin b̥ (β̞) when and wherever the latter had retained the relaxed continuant pronunciation. This b/v merger occurred in all positions in Sardinia, Sicily, Northern Corsica, and in the Southern Italian area. The present northern boundary of the general b/v merger is the Rome-Ancona line, though there is some evidence that during the early Middle Ages the b/v fusion may have extended farther north into the southern portion of Tuscany.[3] A merger of post-liquid and intervocalic b and u̯ is characteristic of Central Italian and Rumanian, while the merger of b (β̞) and u̯ in intervocalic position alone is a remnant of the relaxed pronunciation of b to be found in all of the Romance languages.

In this article I wish to propose the following theory. The general area of the b/v merger in Central and Southern Italy, Sicily and Sardinia was colonized by Rome before the rest of the Romance world; the Latin imported into this area was thus on the way to a strengthening of consonantal articulation, but strengthening had not yet uniformly taken place. Thus throughout this entire area we find in varying degrees remnants of the relaxed consonantal pronunciation of early Latin.

Throughout most of the area of the b/v fusion the Latin voiced

stops appear as continuants: (v), ð, ɣ. In Sardinia they have been strengthened to stops in sentence initial position, but in word or sentence intervocalic position they either appear as continuants or have completely disappeared as in Campidanese or Logudorese.[4] In Southern Italy and Sicily the regular outcome for Latin b, d, g in initial as well as intervocalic position is v(β), ð, ɣ.[5]

The Latin unvoiced stops appear as lenes in parts of Latium, Umbria and the Marche. This lenition, I suggest, should be interpreted as the remnant of the early Latin lenition to be found in the area of very early Romanization. Robert A. Hall, Jr. has tried to show that this area of central Italian lenition is due to medieval importation from the North Italian area of the voicing of Latin intervocalic stops,[6] but Hall's theory is probably erroneous. The North Italian area of voicing north of the Spezia-Rimini line and the Central Italian lenition area do not really merge. Even most of the isoglosses drawn by Hall in order to prove his theory show that points 537 and 529 of the AIS are usually outside of the areas of voicing. The North Italian voicing of -p- results in -v-, the Central Italian lenition gives the result -b-, as is shown by nibote < nepotem (AIS 22, points 654, 643, 615). An even more important difference between the North Italian voicing and the Central Italian lenition is that the latter also affects initial consonants as indicated by b for p as it occurs at points 643, 654, 616, AIS 163 (piede), g for k at points 643, 654, 624, 616, AIS 118 (il collo), d for t at points 643, 654, 615, AIS 100 (le tempie), etc. The Central Italian lenition can thus be explained as a general weakening of articulation, followed by strengthening in some areas. The intervocalic consonants are affected by the weakening in a larger area than the initial consonants, and the velars and dentals are more widely affected than the labials, as can be shown by the comparison of the various maps drawn by Hall, or by a comparison of the extension of the above-quoted nibode with that of forms like formiga (cf. attached map).

The lenition of Latin unvoiced stops is also characteristic of Sardinia and Northern Corsica,[7] areas which the b/v fusion marks as having been affected by the early Latin lenition. Whether the lenition of unvoiced stops in these areas can be considered as a remnant of an early Latin phenomenon is, of course, a complex problem. There is, however, evidence to that effect. While there is no extensive evidence of lenition in early Sardinian, old Logudorese documents do show forms such as as zarena, bona de bare, etc.,[8] indicating that

the Sardinian characteristic of lenisizing in word or sentence intervocalic position may, indeed, have ancient origins. It is further noteworthy that precisely the Sardinian area which does not show lenition of voiced stops (Bitti), lacks also the general b/v fusion and distinguishes b- from v-.[9]

The Corsican lenition of unvoiced stops is also -- as H. Schmeck has shown in a recent study -- almost coextensive with the fusion of b and v.[10] While Schmeck tries to prove that the Corsican lenition is due to importation from Tuscany during the Middle Ages, he himself furnishes proof for the early origin of the phenomenon in Corsica: in Corsica (just as in central Italy) the area of the sonorization of k is larger than that of the sonorization of the other stops; but the reflexes of Latin ke and ki (ts) sonorize in the same area as k. In other words, the Corsican lenition took place at a time when the k of ke or ki was still an allophone of the k phoneme[11] -- a situation which was no doubt characteristic of early Latinity rather than medieval Tuscan.

In his attempt to explain the Corsican lenition by medieval Tuscan influence, Schmeck amassed considerable evidence for medieval lenition in Tuscany. This evidence shows that the lenition which is now characteristic of Latium and Umbria must at one time have extended farther north. Battisti in his study of the Latin dentals noticed the considerable number of instances of voicing in the Lucca documents of the eighth century and pointed out that the frequency of that phenomenon seemed to decrease during the eighth century.[12] S. Piero in his study of old Pisan, and L. Hirsch in his work on the Siena dialect, noticed forms like gomito, sigure, gonstantino, gattivo, goatare in medieval documents.[13] Incidentally, in discussing the evidence for medieval Tuscan voicing, Schmeck also noticed that there is much more abundant evidence for velars than for dentals or labials[14] -- an observation which fits in well with what we have noticed about the relative extension of the Central Italian lenition.

The development of Latin unvoiced stops in Central Italian presents, of course, a well known problem since they appear sometimes voiced (strada), sometimes unvoiced (amato). Today the majority of scholars seems to feel that retention of the unvoiced stops is the normal development, while words with voicing are importations from the North Italian area where the voicing is uniformly regular.[15] However, it seems highly plausible that many words in which Tuscan shows voicing of unvoiced stops are not borrowings from the North, but rather retentions

of an ancient lenition. Probably only careful study of the history of each word could lead to a decision as to whether the voicing in it was native or borrowed from the North. Certainly in such words as piegare, AIS 1530 (< plicare) for which the southern boundary of the -g- form seems to coincide with the general boundary of the Central Italian lenition,[16] the voicing should be connected with that lenition rather than with borrowing.

Another Italian (and general Romance) phenomenon which seems to be the remnant of an early lenition is presented by the generally unexplained cases of initial voicing, which Meyer-Lubke noticed already in his Grammatik.[17] They include forms like Italian gatto, Spanish gato (but French chat); Italian gabbia, Spanish gavia, French geole (*gaviola), but also cage (< cavea); Italian grasso, Spanish graso, French and Rumanian gras (< crassus); Italian gonfiare, Rumanian gunfla (< conflare); Italian gratula, Spanish grada, French grille, Rumanian gratar (< crates). Here again we note that this weakening seems to affect primarily the velars. The coincidence of Italian, Rumanian and French forms seems to indicate that we are dealing with an early Latin rather than a Romance phenomenon. French (chat, cage) does not always follow the example of the other Romance languages; this is evidently due to the fact that we are dealing with a phenomenon of popular speech, not always reflected in the Latin of Gaul -- which, as Professor von Wartburg has explained,[18] inherited generally a less popular, more school-type of Latin.

The last phenomenon for which I should like to suggest here a connection with early Latin lenition is the much-debated change of nt > nd, mp > mb, nd > nn, mb > mm. The change is considered by many scholars to be due to Oscan-Umbrian substratum, primarily because a similar change is attested for Oscan and Umbrian and because the geographic center of the change seems to coincide with the area of Oscan-Umbrian substratum. Other scholars argue against the substratum theory, primarily because changes like nd > nn, mb > mm occur in many unrelated languages, because the change mb > mm, nd > nn occurs in Sicily where there was no Oscan substratum. Furthermore, there is no extensive proof for the early origin of this change.[19] Fairly recently Robert A. Hall, Jr. devoted an article to the very subject of the development of nasal plus homorganic stop in Italian and came to the conclusion, on the basis of linguistic geographic evidence, that at least the changes nt >

nd and mp > mb are likely due to Osco-Umbrian substrata.[20] But here we would like to point out, just as Martinet has done in his recent review of R. Menendez Pidal, Orígenes del español,[21] that the shift nt > nd represents a weakening in the articulation of t, just as the shift nd > nn presupposes a weakening of the d. If nt and nd are to be kept phonemically distinct, nd must first pass to nn, in order to make room for the shift nt > nd.

The geographic extension of the nt > nd, nd > nn, etc. phenomenon seems to bear out well the assumption which connects it with a general weakening in articulation. The shifts mb > mm and nd > nn occur for the most part only in the areas which the b/v fusion marks as having taken part in the early Latin lenition of voiced stops. The exceptions to this general coincidence are Sardinia, Northern Corsica, where the mb > mm and nd > nn changes are only sporadic,[22] some areas in the extreme Northeast of Sicily, Southern Calabria and Southern Apulia[23] — and those Central Italian areas north of the Rome-Ancona line in which the mb > mm change takes place. As far as the last mentioned exception is concerned we have pointed out above that the present northern boundary of the b/v merger along the Rome-Ancona line presents probably the southward regression of a boundary which reached as far as Southern Tuscany and thus coincided well with the mb > mm boundary. The absence of mb > mm and nd > nn in Southern Calabria and Northeastern Sicily is, as Rohlfs points out,[24] easily explained by the fact that these areas were Romanized only in medieval times, and thus show features of a medieval koine rather than indigenous Latin developments. As far as the absence of mb > mm, nd > nn in Sardinia and Corsica is concerned, it coincides with a general strengthening of the non-intervocalic voiced stops which in these areas must have occurred early enough to prevent the mb > mm shift.[25]

The mp > mb and nt > nd shifts should be associated with the general Central Italian lenition of unvoiced stops. True enough, to the south they extend far into the mb > mm, nd > nn territory; but the northern isoglosses of the nt > nd, mp > mb change seems completely identical with that of the lenition of the unvoiced intervocalic stops in words like sputare, fratello, etc., as can be seen by a comparison of the maps drawn by Hall to illustrate the nt > nd and -f- -d- changes for his above quoted article.[26] (See also attached map.)

A final word concerning the historical reason for the northern boundary of lenition phenomena: it seems to us that rather than having any connection with medieval political divisions, it coincides rather well

with the extent of Romanization and Roman colonization achieved at the onset of the Punic wars. A glance at the historical map[27] shows us how at that time Romanization had advanced in Umbria and the Marche (with Ancona being in Roman territory and Rimini being a Roman colony), while Tuscany, except for the very south, was part of the territory of the Allied States, but not of the Roman Republic itself.

In summary, then, I suggest that practically all of Italian consonantism shows in varying degrees remnants of the early Latin lenition, and that the development of Latin consonantism from a weakened to a strengthened articulation is reflected in various parts of Italy and Sardinia according to the time at which they were Latinized. The center of the lenition phenomena, including the lenition of unvoiced stops, seems to lie in the area of original Romanization in Latium and Umbria. That Oscan and Umbrian underwent a lenition similar to that experienced by Latin, as Martinet has pointed out, may thus very well have helped in reinforcing the lenition tendencies of Latin. Yet the general absence of early evidence for such changes as nd > nn in early Latinity seems to indicate that we are dealing here with the results of an inherited tendency rather than with a phenomenon directly acquired by superposition on a substratum. Furthermore, it seems unwarranted to have recourse to substrata explanations if events of the internal history of a language furnish a satisfactory explanation.

1. A. Martinet, "Some Problems of Italic Consonantism", Word, VI (1950), 26-41.

2. Robert L. Politzer, "On b and v in Latin and Romance," Word, VIII (1952), 211-215; "On the Central Italian Development rv > rb," Italica, XXXI (1954), 93-97.

3. G. Rohlfs, Historische Grammatik der Italienischen Sprache (Bern, 1949), Vol. I, p. 249.

4. Max L. Wagner, Historische Lautlehre des Sardischen (Halle, 1941), pp. 78 ff., 95 ff.

5. Rohlfs, op. cit., pp. 247, 257, 261, 348-356. I have suggested elsewhere that β, ð, ɣ for Latin b, d, g may also be the result of Greek influence; cf. "On b and v in Latin and Romance," p. 215. Actually only an examination of the rather complicated and involved historical evidence could furnish a final answer as to whether the β, ð, ɣ reflexes for Latin b, d, g are inherited or due to superstratum. At any rate it seems to me now that the β, ð, ɣ area is too large to be entirely due to Greek influence.

6. Robert A. Hall, Jr., "The Papal States in Italian Linguistic History," Language, XIX (1943), 125-140.

7. Rohlfs, op.cit., p. 247; Helmut Schmeck, "Probleme des Korsischen Konsonantismus," ZRPh, LXVIII (1952), 49-72.

8. Wagner, op.cit., p. 69.

9. Wagner, op.cit., p. 68 and p. 97.

10. Schmeck, op.cit., p. 66.

11. Schmeck, op.cit., p. 69.

12. Carlo Battisti, Le Dentali esplosive intervocaliche nei dialetti italiani (Halle, 1912), p. 159.

13. S. Piero, "Fonetica del dialetto pisano," AGI, XII (1891), 141-160 (p. 150); L. Hirsch, "Laut- und Formenlehre des Dialekts von Siena," ZRPh, IX (1885), 513-570 (pp. 510-562).

14. Schmeck, op.cit., p. 66.

15. For a detailed statement of this theory, see Rohlfs, op.cit., pp. 342 ff. For the opposing theory, namely that voicing is the regular development and that forms with unvoiced stops present Latinisms, see C. Merlo, "Il Sostrato etnico ed i dialetti italiani," L'Italia dialettale, IX (1933), 1-25.

16. See Hall, "The Papal States in Italian Linguistic History," map 8. (Cf. also attached map.)

17. W. Meyer-Lubke, Grammatik der romanischen Sprachen (Leipzig, 1890), Vol. I, pp. 353-354.

18. W. von Wartburg, Die Ausgliederung der romanischen Sprachräume (Bern, 1950), pp. 22 ff.

19. For a typical example of the substratum argument see C. Merlo, "Lazio sannita ed Etruria latina?" L'Italia dialettale, III (1926), 84-93. Rohlfs, op.cit., pp. 418 ff. argues against the substratum theory.

20. Robert A. Hall, Jr., "Nasal and Homorganic Plosive in Central and Southern Italy," Arch. Ling., I (1949), 151-156.

21. Word, VIII (1952), 185.

22. Wagner, op.cit., p. 179 and p. 182; Rohlfs, op.cit., p. 419.

23. Rohlfs, op.cit., p. 418.

24. Rohlfs, op.cit., p. 420.

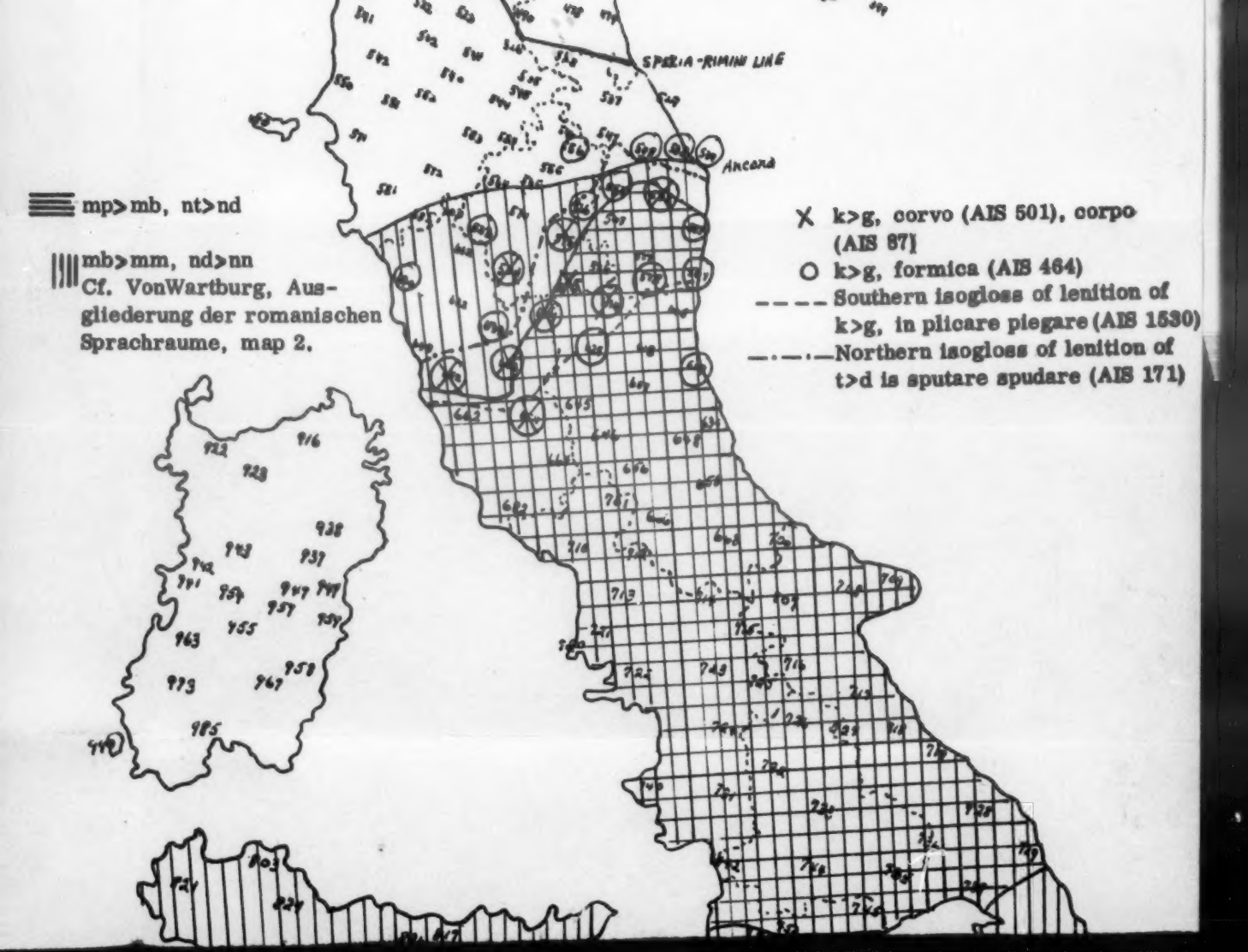
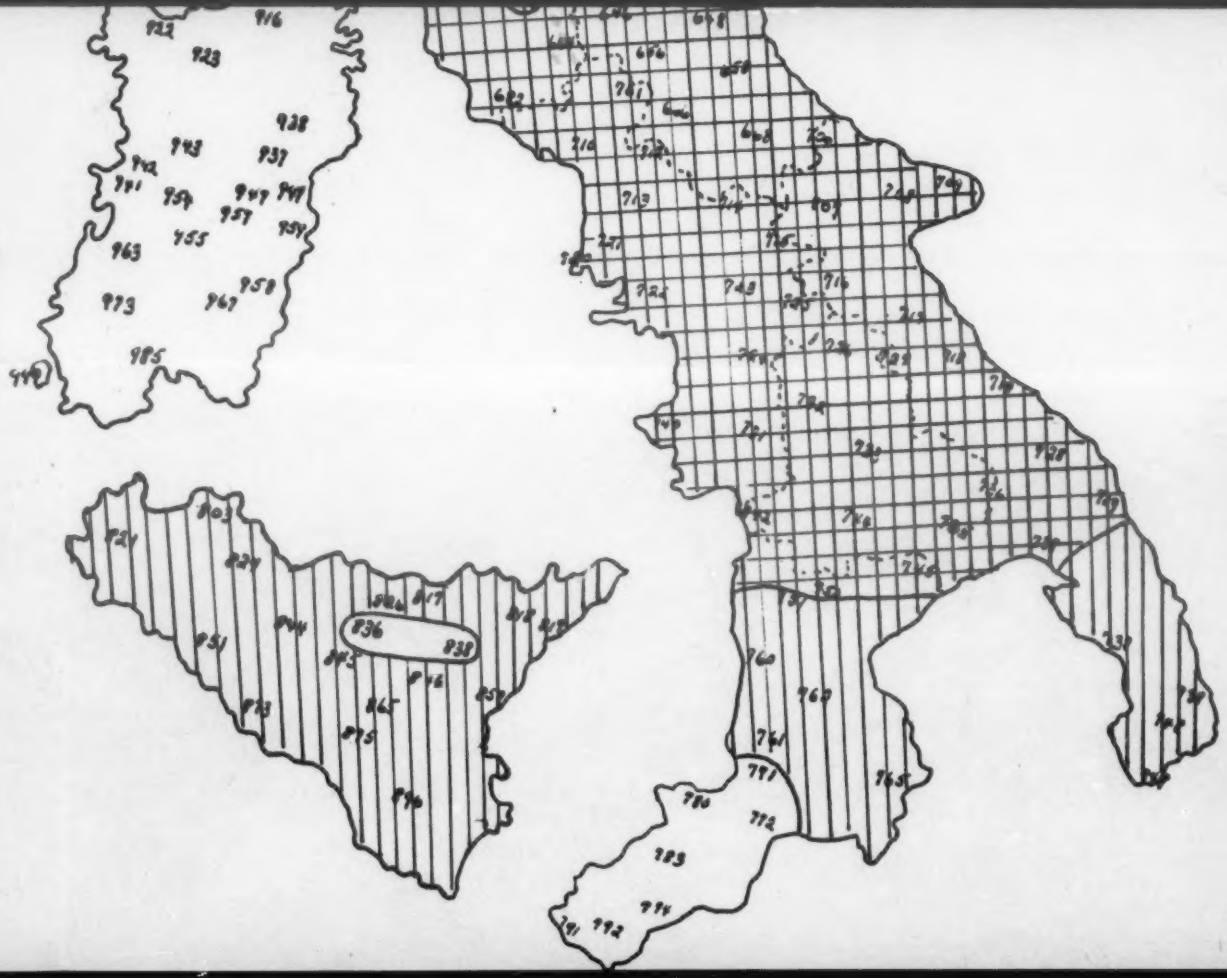
25. It goes beyond the scope of this article to discuss the mb > mm, nd > nn changes in Aragonese which some, including R. Menendez Pidal in his Orígenes del Español, 3rd Edition

(Madrid, 1950), p. 286 ff., have tried to link with Oscan substrata imported into Spain. It can only be suggested here that perhaps as the result of a totally different substratum than Oscan, the Latin spoken on the slopes of the Pyrenees underwent a weakening similar to that which took place in early Latin. It is of interest that A. Martinet, "De la sonorization des occlusives initiales en basque," Word, VI (1950), 224-233, does indeed reconstruct for ancient Basque a consonant system in which the b, d, g phonemes appear intervocalically as β, ð, ɣ and initially as lenes b̥, d̥, g̥.

26. R. A. Hall, Jr., "Nasal and Homorganic Plosives in Central and Southern Italy," map 3; "The Papal States in Italian Linguistic History," figure 4.

27. See Karl Julius Beloch, Römische Geschichte bis zum Beginn der punischen Kriege (Berlin, Leipzig, 1926), map III.

SPECIAL TRAINING UNIT


SPEZIA-RIMINI LINE
Ancona
mp>mb, nt>nd
mb>mm, nd>nn
Cf. VonWartburg, Ausgliederung der romanischen Sprachraume, map 2.
X k>g, corvo (AIS 501), corpo (AIS 87)
O k>g, formica (AIS 464)
Southern isogloss of lenition of k>g, in plicare piegare (AIS 1530)
Northern isogloss of lenition of t>d is sputare spudare (AIS 171)